Electron affinity and photodetachment calculations of Nd\(^{-1}\)

STEVEN M. O’MALLEY, DONALD R. BECK, Physics Department, Michigan Technological University — Our recent relativistic configuration-interaction (RCI) calculations for the bound states of Ce\(^{-2}\) have shown the usefulness of analysis which combines calculated photodetachment cross sections with experimental measurements\(^3\). Here we present RCI results for 8 weakly bound (\(< 0.2\) eV) states of Nd\(^{-}\) (6p attachments to 4f\(^{3}\)6s\(^{2}\)). Photodetachment cross sections involving excited states of Nd\(^{1}\) are expected to resolve the discrepancy with the available experimental electron affinity of 1.916 eV\(^4\). Additional improvements of our methodology are also discussed.

\(^1\)Supported by the National Science Foundation, Grant No. PHY-0097111.